PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY.

VOL. VI. JANUARY—JUNE, 1856. No. 55.

Stated Meeting, January 4.

Present, thirteen members.

Judge KANE, Vice-President, in the Chair.

The judges and clerks of the annual election, held this day, for officers of the Society, made report that the following named gentlemen were elected:

President.

Alexander Dallas Bache.

Vice Presidents.

John K. Kane,
Robley Dunglison,
John F. Frazer.

Secretaries.

Charles B. Trego,
E. Otis Kendall,
Frederick Fraley,
John L. Le Conte.

Members of the Council, for Three Years.

Isaac Hays,
Charles D. Meigs,
Henry Vethake,
Robert Bridges.

Curators.

Franklin Peale,
John C. Cresson,
M. Fisher Longstreth.

Treasurer.

Charles B. Trego.

The following donations were announced:—

FOR THE LIBRARY.

Memoirs of the Literary and Philosophical Society of Manchester. Second Series. Vols. XI. XII. London, 1854–5. 8vo.—*From the Society.*

Journal of the Franklin Institute. Third Series. Vol. XXX. No. 6. Dec. 1855. Philadelphia. 8vo.—*From the Institute.*

Report of the Commissioner of Patents, for the year 1854. *Arts and Manufactures.* Vols. I. II. Washington, 1855. 8vo.—*From the Hon. J. R. Tyson.*

Message of James Pollock, Governor of Pennsylvania, to the Legislature, 1856. Harrisburg. 8vo.—*From Eli K. Price, Esq.*

The American Journal of the Medical Sciences. No. LXI. New Series. January, 1856. Philadelphia. 8vo.—*From Dr. Isaac Hays, Editor.*

The Medical News and Library. Vol. XIV. No. 157. Jan. 1856. Philadelphia. 8vo.—*From Blanchard & Lea.*

Pending nominations for membership were read.

Stated Meeting, January 18.

Present, twenty-six members.

Dr. DUNGLISON, Vice-President, in the Chair.

Letters were read:—

From the Royal Prussian Academy of Sciences, dated Berlin, Aug. 23, 1855, announcing a donation for the library, and returning thanks for publications of this Society.

From the Imperial Academy of Sciences, dated Vienna, Oct. 1, 1855, accompanying a donation for the library.

The following donations were announced:—

FOR THE LIBRARY.

Abhandlungen der Königlichen Akademie der Wissenschaften zu Berlin: aus dem Jahre, 1854. Berlin, 1855. 4to.

Monatsberichte der K. Akad. der Wissenschaften zu Berlin, aus dem Jahre, 1855. Berlin. 8vo.—*From the Royal Academy of Sciences, Berlin.*

Sitzungsberichte der K. Akad. der Wissenschaften zu Wien:—Math. Nat. Classe, XV. Band, 3 Heft. XVI. Band, 1 Heft.—Phil. Hist. Classe, XV. Band, 2, 3 Heft; XVI. Band, 1 Heft. Wien. 1855. 8vo.—*From the Imperial Academy of Sciences, Vienna.*

Monthly Notices of the Royal Astronomical Society. Vol. XV. No. 2. London. 8vo.—*From the Society.*

Proceedings of the Boston Society of Natural History. Vol. V. No. 17. Boston. 8vo.—*From the Society.*

Proceedings of the New Jersey Historical Society. Vol. VII. No. 4. Newark. 8vo.—*From the Society.*

The African Repository. Vol. XXXI. No. 1. Jan. 1856. Washington. 8vo.—*From the American Colonization Society.*

The American Journal of Science and Arts. Second Series. Vol. XXI. No. 61. Jan. 1856. New Haven. 8vo.—*From Profs. Silliman & Dana, Editors.*

Report of the Superintendent of the Coast Survey, showing the progress of the Survey during the year 1854. Washington. 8vo.—*From A. D. Bache, Superintendent.*

The Right Use of History: An Anniversary Discourse delivered before the Historical Society of Pennsylvania. By William Parker Foulke, of Philadelphia. Philadelphia, 1856. 8vo.—*From the Historical Society of Pennsylvania.*

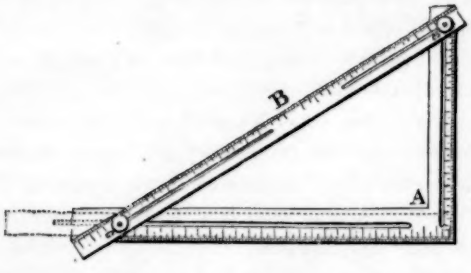
Jewelry and the Precious Stones: with a History and Description from Models of the largest individual Diamonds known: including, particularly, a consideration of the Koh-i-noor's claim to notoriety. By Hipponax Roset. Philadelphia, 1856. 8vo.—*From Joseph R. Paxton, Esq.*

The Astronomical Journal. Vol. V. No. 18. Cambridge. 4to.—*From Dr. B. A. Gould, jr., Editor.*

The Rev. Dr. Rogers read a communication, illustrated by a model and diagrams, on an improvement in the construction of the ordinary carpenters' square, rendering it practically applicable to uses for which, in its present form, it is not calculated.

The attention of the members of the Society is respectfully requested to a model of an improvement on the common square used by mechanics, which it is thought is possessed of some peculiar advantages. It consists of a moveable limb, attached to the common square, with corresponding graduations. This limb is so arranged that the square

can be used for all ordinary purposes, when not required for those for which it is especially designed, and is applicable to the measurement of extended dimensions by a simple reduction in the value of the proportional parts. For which reason the graduations are in inches and twelfths of an inch, to represent with greater ease the measurement of feet and inches in its practical application.



Upon examination of the above diagram, it will be observed that the letter *A* designates the ordinary carpenter's square, and the letter *B* the moveable limb, which is connected with it by steel pins and a securing thumb-screw, *C*. These pins are arranged so as to traverse with ease in the slots which appear in the diagram, in both members of the square, and also in the moveable limb, thus allowing the limb to take any position that may be required in either or both members of the square, and securing it in such a position by the thumb-screw, *C*. The dotted line, shown in the diagram, on the principal member of the square, represents the position of the moveable limb when not required for use. In this position it does not interfere with the use of the square for ordinary purposes, the width of the limb being such as not to conceal the graduations of the square. It is to be observed, that the length of the limb is such that, when placed at the extreme of the slots heretofore described, the ends of the graduated edge will correspond with the ends of the graduated edges of each member of the square, and any deviation therefrom will show, at a glance, when the instrument is out of square.

The practical mechanic will at once discover the value of this instrument in many instances in his daily labours, combining, as it does, accuracy, simplicity and rapidity of operation, and securing economy of time and material. For instance, in its application to ***braces***, in ordinary framing, where the footing and bearing being known, the length and mitre of each end can be determined in a moment. So, also, in the construction of ***carriages for stairs***, the rise

and tread being determined, the limb is then arranged on the members of the square to correspond therewith, and the instrument thus arranged being applied to the plank from which the carriage is to be cut, the members of the square will give the scribing edge required for the saw.

To explain more clearly the practical operation of this instrument, we will suppose that the length and mitre of a brace is required, where the perpendicular bearing is ten (10) feet, and the horizontal footing is six (6) feet, all that is required in this case is to place the zero point of the moveable limb at ten (10) on the long member of the square, causing the graduated edge of the limb to intersect the graduated edge of the other member of the square at six (6), when the length of brace required may be found by the reading on the limb at the point of intersection, which will give, as the required length of brace, eleven (11) feet eight (8) inches. And, upon securing the moveable limb to the members of the square, by the thumb-screws, and applying the edge of the moveable limb to the side of scantling, the members of the square will give a scribing edge for the two mitres desired.

The sum of the squares of the two sides of a right angled triangle is equal to the square of the hypotheneuse.

$$
\begin{array}{rl}
10^2 = & 100 \\
6^2 = & 36 \\
 & \text{---} \\
 & 136 \quad (11.66 = 11 \text{ feet } 8 \text{ inches.} \\
 & 1 \\
 & \text{---} \\
 & 21)36 \\
 & \quad 21 \\
 & \quad \text{---} \\
 & 226)1500 \\
 & \quad 1356 \\
 & \quad \text{------} \\
 & 2326)14400 \\
 & \quad 13956 \\
 & \quad \text{======}
\end{array}
$$

A coin of *aluminum* was offered for the inspection of the members by Mr. Du Bois, accompanied by a communication on the subject.

In a former communication on the subject of *aluminum*, some remarks were made on the probability of its fitness for coinage, at a future day. The accompanying specimen of coin, struck in that metal, is exhibited as an illustration of that point. It is of the half dollar size, a little too thick; at the proper dimensions its weight would be 52½ grains, a little more than one-fourth the weight of the silver half dollar. Its specific gravity is 2.8, being probably not quite free from iron; and there being some enhancement of gravity by the pressure in coinage. To show, however, that the metal is very firm and close in its texture (as might not be supposed, on account of its exceeding lightness), it may be mentioned, that the amonnt of compression, by the blow of coinage, was not much greater than is effected upon a planchet of copper.

The price of the metal is said already to have fallen from a gold to a silver valuation, and to be manufactured to some extent at Rouen.

The Society then proceeded to the election of a librarian, and Mr. Trego was re-elected.

The annual Standing Committees were appointed as follows:

Finance; Mr. Wagner, Mr. Justice, Mr. Fraley.
Hall; Mr. Peale, Mr. Fraley, Mr. Trego.
Library; Dr. Hays, Mr. Ord, Rev. Dr. Stevens.
Publication; Mr. Trego, Dr. Elwyn, Prof. Frazer.

The list of surviving members of the Society was read:—the number on the first of January, 1856, was 378,—of whom are resident in the United States 273, and in foreign countries 105.

The Society next proceeded to ballot for candidates for membership.

On motion, permission was granted to Mrs. Coolidge, the grand-daughter of Thomas Jefferson, or to Mr. Henry S. Randall, to have a copy taken by daguerreotype, or otherwise, of the Society's portrait of Mr. Jefferson, subject to the usual guaranty, for the safe return of the original to the Hall of the Society.

All other business having been concluded, the ballot-boxes were opened by the presiding officer, and the following named

gentlemen were declared to be duly elected members of the Society:—

Henry Coppee, of Philadelphia.
George Allen, do.
Strickland Kneass, do.
Henry William Field, of London.
John P. Brown, of Constantinople.
George Augustus Matile, of Philadelphia.
Thomas L. Kane, do.
William B. Reed, do.
Clement A. Finley, do.
Albert S. Letchworth, do.

Stated Meeting, February 1.

Present, thirteen members.

Dr. Dunglison, Vice-President, in the Chair.

Mr. Strickland Kneass, Prof. Henry Coppée, Dr. C. A. Finley and Mr. Thomas L. Kane, recently elected members, were introduced and took their seats.

Letters were read from Prof. Henry Coppée, William B. Reed, and Prof. G. A. Matile, dated Philadelphia, January 21, 1856; from Thomas L. Kane and Dr. C. A. Finley, dated Philadelphia, January 22, 1856; from Prof. George Allen, dated Philadelphia, January 26, 1856; from Strickland Kneass and from Albert S. Letchworth, dated Philadelphia, January 26, 1856,—respectively acknowledging the receipt of notice of their election as members of the Society:—

From the Society of Antiquaries, dated Somerset House, London, Nov. 20, 1855; and from the Linnean Society, dated London, Nov. 9, 1855, both returning thanks for Nos. 51, 52 of the Proceedings of the Society:—

From the Historical Society of Pennsylvania, dated Philadelphia, January 25, 1856, acknowledging the receipt of No. 54 of the Proceedings: and—

From the Bath and West of England Society, dated Bath,

October 23, 1855, announcing a donation for the library, and returning thanks for Transactions and Proceedings of the Society.

The following donations were announced:—

FOR THE LIBRARY.

Philosophical Transactions of the Royal Society of London, for the year 1855. Vol. 145. Part 1. London. 4to.

Proceedings of the Royal Society of London. Vol. VII. Nos. 14, 15. June, 1855. London. 8vo.

Supplement to the Practical Rules for ascertaining the Deviations of the Compass which are caused by the Ship's Iron, &c. By Archibald Smith, Esq. M.A. &c. London, 1855. 8vo.—*From the Royal Society.*

Transactions of the Linnean Society of London. Vol. XXI. Part 4. 1855. 4to.

Proceedings of the Linnean Society, June 20, 1854, to June 19, 1855; with List of Members for 1855.—Address of Thomas Bell, Esq. V. P. R. S. &c. the President, together with Obituary Notices of Deceased Members, by John J. Bennett, Esq. F.R.S. the Secretary,—read at the Anniversary Meeting of the Linnean Society, May 24, 1855. London. 8vo.—*From the Society.*

Transactions of the Zoological Society of London. Vol. IV. Parts 2, 3. London. 4to.

Proceedings of the Zoological Society. Parts 18–22, 1850–1854:—Part 23, Jan. 9 to June 12, 1855. London. 8vo.—*From the Society.*

Journal of the Royal Asiatic Society of Great Britain and Ireland. Vol. XIII. Part 2, 1852:—Vol. XV. Part 2, 1855. London. 8vo.

Three Maps relating to Assyria and its Antiquities. By Felix Jones, Com. Indian Navy and Surveyor in Mesopotamia. Baghdad, July, 1852.—*From the Society.*

Address at the Anniversary Meeting of the Royal Geographical Society, 28th May, 1855. By the Right Hon. the Earl of Ellesmere, K. G. D. C. L. &c. President. London, 1855. 8vo.—*From the Society.*

Notices of the Meetings of the Members of the Royal Institution of Great Britain. Part V. Nov. 1854–July, 1855. London. 8vo.—*From the Institution.*

Report of the Twenty-fourth Meeting of the British Association for the Advancement of Science,—held at Liverpool, Sept. 1854. London, 1855. 8vo.—*From the Association.*

Transactions of the Royal Irish Academy. Vol. XXII. Part 6. 1855. 4to.

Proceedings of the Royal Irish Academy. Vol. VI. Part 2, 1854–5. Dublin. 8vo.—*From the Academy.*

Journal of the Bath and West of England Society for the Encouragement of Agriculture, Arts, Manufactures and Commerce. New Series. Vols. 1, 2, 3. 1853–4–5. London. 8vo.—*From the Society.*

Monthly Notices of the Royal Astronomical Society. Vol. XVI. No. 2. Dec. 14, 1855. London. 8vo.—*From the Society.*

Flora Batava, of Afbeelding en Beschrijving van Nederlandsche Gewassen. Aflevering 177. Amsterdam. 4to.—*From the King of Holland.*

Journal of the Franklin Institute. Third Series. Vol. XXXI. No. 1. Jan. 1856. Philadelphia. 8vo.—*From the Institute.*

Proceedings of the Academy of Natural Sciences of Philadelphia. Vol. VII. No. 12. Nov. Dec. 1855. Philadelphia. 8vo.—*From the Academy.*

Theory of the Winds. By Capt. Charles Wilkes, U. S. N.—Read before the American Scientific Association, at Providence, Aug. 20, 1855. Accompanied by a Map of the World, showing the extent and direction of the Winds. To which is added Sailing Directions for a Voyage around the World: by the same Author. Philadelphia, 1855. 8vo.—*From the Author.*

Dr. Le Conte presented a communication entitled "Revision of the Cicindelæ of the United States," which was referred to a committee consisting of Prof. Haldeman, Dr. Bridges and Mr. Peale.

Dr. Kane exhibited a number of sketches illustrative of the ice-growth in the Arctic regions, and described the manner of its accumulation in the great ice-belt of the high northern latitudes,—explaining the difference between this and the ordinary shore-ice of other formations.

Mr. Trego, reporter of the Society, laid upon the table No. 54 of the Proceedings, recently published.

Stated Meeting, February 15.

Present, seventeen members.

Prof. FRAZER, Vice-President, in the Chair.

Prof. G. A. Matile, Mr. A. S. Letchworth and Prof. George Allen, recently elected members, were presented to the presiding officer and took their seats.

Letters were read:—

From the Rev. W. R. De Witt, State Librarian, dated Harrisburg, Jan. 31, 1856;—from the American Antiquarian Society, dated Worcester, Mass. Feb. 1, 1856;—from the New Jersey Historical Society, dated Newark, Feb. 2, 1856;—from the Corporation of Yale College, dated New Haven, Feb. 5, 1856, and from the Connecticut Historical Society, dated Hartford, Feb. 6, 1856,—severally returning thanks for No. 54 of the Proceedings of the Society.

The following donations were announced:—

FOR THE LIBRARY.

Information concerning the History, Condition and Prospects of the Indian Tribes of the United States: Collected and prepared under the direction of the Bureau of Indian Affairs, per Act of Congress of March 3, 1847. By Henry R. Schoolcraft, L.L.D. Part V. Philadelphia, 1855. 4to.—*From the Commissioner of Indian Affairs.*

Reports of Explorations and Surveys to ascertain the most practicable and economical route for a Railroad from the Mississippi river to the Pacific Ocean:—made under the direction of the Secretary of War, in 1853-4, according to Acts of Congress. Vol. I. Washington, 1855. 4to.—*From Col. J. J. Abert.*

Journal of the Franklin Institute. Third Series. Vol. XXXI. No. 2. Feb. 1856. Philadelphia. 8vo.—*From the Institute.*

Journal of the Academy of Natural Sciences of Philadelphia. New Series. Vol. III. Part 2. Philadelphia, 1855. 4to.—*From the Academy.*

Report on the Recent Progress of Organic Chemistry, made to the American Association for the Advancement of Science, August,

1855. By Dr. Wolcott Gibbs. Cambridge, 1855. 8vo.—*From the Author.*

Science and the Bible: a Review of the "Six Days of Creation," of Prof. Tayler Lewis. By James D. Dana, Silliman Professor of Natural History in Yale College. Andover, 1856. 8vo.—*From the Author.*

Illustrations of the Birds of California, Texas, Oregon, British and Russian America. By John Cassin, Mem. Acad. Nat. Sci. &c. Nos. 6, 7, 8, 9, 10. Philadelphia. 8vo.—*From the Author.*

Medical News and Library. Vol. XIV. No. 158. Feb. 1856. Philadelphia. 8vo.—*From Blanchard & Lea.*

The committee to which was referred Dr. Le Conte's paper on the Cicindelæ of the United States reported in favour of its publication in the Transactions, which was ordered accordingly.

Dr. R. E. Rogers exhibited Schönbein's Ozone scale and the test-papers saturated with iodide of potassium and starch used in connection with it. The scale consists of ten shades of blue, which are numbered from the faintest to the deepest tint. By means of this scale the ozone in the atmosphere, by its effect upon the test-papers in rendering them more or less blue after a given period of exposure, may be quantitatively compared at different times.

Dr. R. referred to some experiments he was now making, the results of which he was not yet prepared to report, on the disinfecting and antiseptic action of ozone, and expressed his belief that it is one of the most powerful agents in these respects, as it is known to be in its bleaching power.

The proceedings of the Board of Officers and Council at their last meeting were read.

Mr. Justice having taken the chair, Prof. Frazer called the attention of the Society to the recommendation of the Board of Officers and Council at their late meeting, with regard to increasing the salary of the librarian;—and moved that the laws of the Society be so amended that Article 7 of Chapter VIII. shall read as follows: "He shall receive such annual salary as the Society shall by resolution direct:"—Which motion, in accordance with the laws regulating amendments, is laid over for action at the next stated meeting, on the requisite notice being given.

Stated Meeting, March 7.

Present, twenty-two members.

Judge KANE, Vice-President, in the Chair.

Letters were read:—

From the Geological Society, of London, dated Somerset House, Nov. 22, 1855, returning thanks for Nos. 51, 52 of the Proceedings of this Society:—

From the Trustees of the Boston Athenæum, dated Boston, Feb. 2;—and from the Smithsonian Institution, dated Washington, Feb. 10, 1856, acknowledging the receipt of No. 54 of the Proceedings.

The following donations were announced:—

FOR THE LIBRARY.

Proceedings of the Boston Society of Natural History. Vol. V. No. 18. Boston. 8vo.—*From the Society.*

The African Repository. Vol. XXXII. No. 2. Feb. 1856. Washington. 8vo.—*From the Am. Colonization Society.*

Monthly Notices of the Royal Astronomical Society. Vol. XVI. No. 3. Jan. 11, 1856. London. 8vo.—*From the Society.*

Twenty-first Annual Report of the Board of Directors of the Young Men's Library Association of Cincinnati, for the year 1855. Cincinnati. 8vo.—*From the Association.*

Official Army Register for 1856: published by order of the Secretary of War. Washington. 8vo.—*From S. Cooper, Adjutant General.*

Report of the Superintendent of the U. S. Coast Survey, showing the progress of the Survey during the year 1854. Washington. 8vo.—*From the Hon. J. R. Tyson.*

The American Journal of Science and Arts. Second Series. Vol. XXI. No. 62. March, 1856. New Haven. 8vo.—*From Profs. Silliman & Dana, Editors.*

Report of the Pennsylvania Hospital for the Insane, for the year 1855. By Thomas S. Kirkbride, M.D. Physician to the Institution. Philadelphia. 8vo.—*From the Author.*

The Scholar's Panoply, as illustrated by the Shield of Achilles;—the Biennial Oration delivered before the Zelosophic Society of the

University of Pennsylvania. By Henry Coppée, Professor of English Literature in the University of Pennsylvania. Philadelphia, 1856. 8vo.—*From the Author.*

Rapport du Surintendant de l'Education pour le Bas-Canada, pour 1854. Quebec, 1855. 8vo.

The Farmer's Journal and Transactions of the Lower Canada Board of Agriculture. Vol. III. No. 10. Feb. 1856: with Prize List of the Agricultural Association of Lower Canada for the year 1856. Montreal. 4to.—*From L. A. Huguet Latour, N. P. of Montreal.*

The Medical News and Library. Vol. XIV. No. 159. March, 1856. Philadelphia. 8vo.—*From Blanchard & Lea.*

The Florist and Horticultural Journal. Vol. IV. No. 9. Philadelphia, 1856. 8vo.—*From H. C. Hanson, Editor.*

The Documentary History of the State of New York:—arranged under the direction of the Hon. Christopher Morgan, Secretary of State. By E. B. O'Callaghan, M.D. Vols. I. II. III. IV. Albany, 1850–51. 4to.—*From Henry S. Randall, Esq.*

Dr. Bell announced the death of Dr. William P. C. Barton, a member of the Society, who died on the 28th of February last, aged 69 years.

Mr. Peale solicited the attention of the members to a contrivance called the *skater's reel,* invented by him several years since:—exhibiting the instrument and showing the method of using it.

A spool of light wood, to which is attached, by one end, a thin but strong cord, about forty feet in length, which cord is wound around the spool, filling all the space between the two ends, somewhat similar to the ordinary cotton spool, so familiar to the domestic eye, but, of course, on a larger scale; the other end of the cord is spliced into a loop, which can be converted, in a moment, to a running noose.

The reel is usually carried in the pocket, being of a convenient size for that purpose, or in the breast of the coat; and the manner of use Mr. Peale illustrated by slipping the noose over the wrist, and throwing the reel to a person supposed to have "broken in:" or it may be thrown out, by a person who is in the water, and thus the instantaneous assistance given, which is so important under such circumstances.

Mr. Peale mentioned that the instrument was original with himself;

that he had carried it during the skating seasons of the last quarter of a century, and had used it serviceably in several instances; and that the statistics of the Skaters' Club of Philadelphia showed that a large number of persons had been rescued by the members, with its aid, of which the late winter had afforded several very remarkable instances; proving that simple means at hand, and ready for instantaneous use, are of more value than the most costly arrangements under other circumstances.

The requisite notice having been given, the Society proceeded to the consideration of the amendment to the laws proposed at last meeting, and the question being taken thereupon, the proposed amendment was agreed to;—making Article 7 of Chapter VIII. read as follows: "He shall receive such annual salary as the Society shall by resolution direct."

It was then resolved that the salary of the librarian, for the present year, be fixed at one thousand dollars.

Prof. Frazer mentioned that Mr. Thomas Sully was desirous of painting a copy of the portrait of Dr. Robert M. Patterson, late President of the Society, and moved that Mr. Sully have permission to copy the portrait, under the usual conditions:—which motion was agreed to.

Dr. Dunglison having taken the chair, Judge Kane offered the following resolution:—Resolved, That the President or one of the Vice-Presidents, and one or more of the Secretaries be and they are hereby authorized to execute such deeds and conveyances to the Government of the United States, of the Hall now occupied by the Society, as, in the opinion of the Committee referred to in the resolution of the 17th of August last, may be proper for giving effect to the resolution adopted at that meeting:—Which was read, considered and adopted.

Stated Meeting, March 21.

Present, fourteen members.

Dr. DUNGLISON, Vice-President, in the Chair.

Letters were read:—

From Henry W. Field, of London, dated Her Majesty's

Mint, Feb. 22, 1856, acknowledging the receipt of notice of his election as a member of the Society:—

From the Imperial Society of Naturalists of Moscow, dated 17–29 February, 1856, in answer to a letter from this Society of Oct. 19, 1855, on the subject of the celebration of the fiftieth anniversary of the Society of Naturalists: and—

From G. C. Swallow, State Geologist of Missouri, dated Columbia, Mo., Feb. 27, 1856, accompanying a donation for the library.

The following donations were announced:—

FOR THE LIBRARY.

Journal of the Franklin Institute. Third Series. Vol. XXXI. No. 3. March, 1856. Philadelphia. 8vo.—*From the Institute.*

Proceedings of the Boston Society of Natural History. Vol. V. No. 19. Feb. 1856. Boston. 8vo.—*From the Society.*

Report of the Secretary of the Treasury, transmitting a Report from the Register of the Treasury, of the Commerce and Navigation of the United States, for the year ending June 30, 1855. Washington. 8vo.—*From the Hon. J. R. Tyson.*

Mortality Statistics of the Seventh Census of the United States, 1850: with comparative and illustrative tables. By J. B. De Bow, Superintendent U. S. Census. Washington. 8vo.—*From the same.*

The First and Second Annual Reports of the Geological Survey of Missouri. By G. C. Swallow, State Geologist. Jefferson City, 1855. 8vo.—*From the Author.*

The Practicability of constructing Cannon of great calibre, capable of long continued use under full charges. By Daniel Treadwell, V. P. Am. Acad. &c. Cambridge, 1856. 8vo.—*From the Author.*

The Astronomical Journal. Vol. IV. No. 19. March 19, 1856. Cambridge. 4to.—*From Dr. B. A. Gould, jr. Editor.*

The Rev. Dr. Rogers referred to a former communication made by him on an improvement in the construction of the ordinary carpenters' square. He now exhibited a model of the instrument, and illustrated its use by diagram.

Dr. Emerson, in reference to the peculiar severity of the present winter, remarked upon the character of the first great snow-storm of the season, which consisted of snow of a dry

and granular consistency, and was followed by intense cold. Immediately succeeding the storm, the thermometers indicated a lower degree of temperature to the southward of Philadelphia than to the northward. Attributed to the peculiar character of this snow-storm, the deep and intense freezing of the soil beneath, and the unusual cold of the winter.

The Committee on the sale of the Society's Hall reported articles of an agreement for the sale of the Hall to the Government of the United States, for the purpose of holding courts of justice therein and offices connected therewith:—Which agreement was read, approved, and ordered to be executed.

On motion of Dr. Franklin Bache it was resolved,—That the Secretaries be directed to write to those members appointed to prepare obituary notices prior to 1854, and who have not yet read them, reminding them of their appointment and requesting to be informed when it will be convenient for them to fulfil the duties assigned to them.

Stated Meeting, April 4.

Present, seventeen members.

Dr. Dunglison, Vice-President, in the Chair.

Letters were read:—

From the Statistical Society, dated London, Oct. 11, 1855, acknowledging the receipt of No. 51 of the Proceedings of this Society:—

From the Royal Saxon Society of Sciences, dated Leipzig, Nov. 24, 1855, returning thanks for Proceedings, Jan.–Dec. 1854:—

From the Lyceum of Natural History of New York, dated March 20, 1856, acknowledging the receipt of No. 53 of the Proceedings: and—

From Clement A. Finley, M.D. Surgeon U. S. A. dated Philadelphia, April 4, 1856, presenting a donation for the library, on behalf of Brig. Gen. Lawson, Surgeon General of the U. S. Army.

The following donations were announced:—

FOR THE LIBRARY.

Monthly Notices of the Royal Astronomical Society. Vol. XVI. No. 4. Feb. 8, 1856. London. 8vo.—*From the Society.*

Annals of the Lyceum of Natural History of New York. Vol. VI. No. 5. Oct. 1855. New York. 8vo.—*From the Lyceum.*

Proceedings of the Academy of Natural Sciences of Philadelphia. Vol. VIII. No. 1. Jan. Feb. 1856. Philadelphia. 8vo.—*From the Academy.*

The African Repository. Vol. XXXII. No. 3. March, 1856. Washington. 8vo.—*From the Am. Colonization Society.*

Report of the Secretary of the Treasury of the United States, on the state of the Finances, for the year ending June 30, 1855. Washington. 8vo.—*From the Hon. J. R. Tyson.*

Report of the State Librarian to the Legislature of Pennsylvania; with a Catalogue of Books, for the year 1855. Harrisburg. 8vo.—*From the Rev. W. R. De Witt, State Librarian.*

A Manual of Instruction for the South African College. *Science, Part* 1. Elementary Geometry, according to a Natural System. *Literature, Part* 1. The Principles of Grammar, applied to the English Language. 2 vols. Cape Town, 1838, 1846. 8vo.—*From the Author, J. C. Adamson, D.D.*

The American Journal of the Medical Sciences. No. LXIII. New Series. April, 1856. Philadelphia. 8vo.—*From Dr. Isaac Hays, Editor.*

The Medical News and Library. Vol. XIV. No. 160. April, 1856. Philadelphia. 8vo.—*From Blanchard & Lea.*

The First and Second Annual Reports of the Geological Survey of Missouri. By G. C. Swallow, State Geologist. Jefferson City, 1855. 8vo.—*From Mr. F. B. Meek.*

Army Meteorological Register, for twelve years, from 1843 to 1854, inclusive, compiled from observations made by the Officers of the Medical Department of the Army, at the Military Posts of the United States.—Prepared under the direction of Brevet Brigadier General Thomas Lawson, Surgeon General, U. S. Army. Washington, 1855. 4to.—*From Gen. Lawson.*

Revision of the Cicindelæ of the United States. By John L. Le Conte, M.D. (From the Transactions of the Am. Phil. Society. Vol. XI.) Philadelphia, 1856. 4to.—*From the Author.*

Mr. Du Bois laid upon the table, for the inspection of members, sundry articles of interest, recently added to the Mint Cabinet.

1. The *itzebue*, silver coin of Japan; of which there is no mention in print, as it differs much from the itzebue formerly described by Dutch traders. It is 991 thousandths fine (no doubt regarded there as absolutely fine), and worth 38 cents of our money. Since the treaty with Japan, a number of these have appeared at San Francisco, whence this piece came. The opening of trade with that country, will make it important to know the value of Japanese money.

2. Medal, presented by the merchants of Boston to Com. Perry, who concluded the treaty with Japan. Engraved by Mitchell, and struck at the mint.

3. 20 shilling piece of James I., and six-pence of Elizabeth; remarkable only as being part of the contents of an earthen pot, lately dug up at Richmond's island, mouth of the Saco river, State of Maine. According to the published accounts, the treasure was buried there, apparently, about 1630 to 1640.

4. Gold in quartz, from Australia; precisely similar in character to the auriferous matrix in California, Georgia and elsewhere.

Mr. Trego made some observations upon the remarkable similarity between the specimens of auriferous quartz from Australia and those from the gold-bearing regions of the United States.

Mr. Peale spoke of the superior execution of the medal presented to Com. Perry, and attributed high credit to the artist for the execution of the head;—excepting, however, from his commendation the lettering of the medal.

Dr. Hallowell offered, for the Transactions, a communication "On a New Genus of the Boædæ," which was referred to a Committee consisting of Dr. Bridges, Dr. Hays and Dr. Leidy.

The Committee on the sale of the Hall reported that the article of agreement with the Government of the United States, presented at last meeting, was duly executed on Saturday, 22d ultimo.

On motion of Mr. Justice, it was resolved that the Board of Officers and Council be instructed to inquire into the expediency of purchasing a Microscope, for the use of the Society.

Stated Meeting, April 18.

Present, twenty-one members.

Prof. FRAZER, Vice-President, in the Chair.

Letters were read:—

From John P. Brown, dated American Legation, Constantinople, Turkey, March 6, 1856, acknowledging the receipt of notice of his election as a member of the Society:—

From H. Bossange & Son, dated 25 Quai Voltaire, Paris, January, 1856, accompanying a donation for the library: and—

From Dr. Charles W. Short, dated near Louisville, Kentucky, April 5, 1856, giving reasons for not fulfilling his appointment by the Society to prepare an obituary notice of the late Mr. William Short, and requesting to be released from the duty assigned.

The following donations were announced:—

FOR THE LIBRARY.

Annales des Mines. V. Série. Tome VII. 1 livraison de 1855. Paris. 8vo.—*From the Engineers of l'Ecole des Mines.*

Documents relating to the Colonial History of the State of New York, procured in Holland, England and France, by John Romeyn Brodhead, Agent, &c. Edited by E. B. O'Callaghan, M.D. Vol. VI. Albany, 1855. 4to.—*From the Regents of the University of the State of New York.*

Results of a Series of Meteorological Observations, made in obedience to instructions from the Regents of the University, at sundry Academies in the State of New York, from 1826 to 1850, inclusive. Compiled from the original returns, and the Annual Reports of the Regents of the University, by Franklin B. Hough, A.M. M.D. &c. &c. Albany, 1855. 4to.—*From the same.*

Sixty-ninth Annual Report of the Regents of the University of the State of New York: transmitted to the Legislature Jan. 15, 1856. Albany. 8vo.—*From the same.*

Annual Report of the Trustees of the New York State Library: transmitted to the Legislature January 22, 1856. Albany. 8vo.—*From the same.*

Journal of the Franklin Institute. Third Series. Vol. XXXI. No. 4. April, 1856. Philadelphia. 8vo.—*From the Institute.*

Ma Bibliothèque Française. Paris. 12mo.—*From Hector Bossange & Son.*

The Committee appointed at last meeting, on a communication by Dr. Hallowell, "On a New Genus of Boædæ from Cuba," reported in favour of its publication in the Transactions of the Society, which was ordered accordingly.

Judge Kane announced the decease of Thomas I. Wharton, Esq. a member of this Society, who died April 7, 1856, aged 65:—

And, on motion of Dr. Franklin Bache, Judge Kane was appointed to prepare an obituary notice of Mr. Wharton.

Mr. Durand made a communication concerning the collection of plants brought from the Arctic regions by the expedition under the command of Dr. Kane.

The collections of plants, brought by Dr. E. K. Kane, from his two voyages to the polar regions, comprehend 148 species—77 of which are dicotyledonous; 29 monocotyledonous, and 42 cryptogamous plants: all from the western coast of Greenland, between the 64th and 80th north parallels.

Although compelled, by the casualties of his voyage back to the United States, to sacrifice several of his packages, Dr. Kane's collections are yet among the richest ever brought by arctic and polar explorers. They not only afford a great accession to our previous knowledge of the polar vegetation, but they, almost, complete the flora of northern Greenland, by adding 27 new species to the 49 alloted by Sir J. Richardson, in his statistical tables, to the polar section of that vast island, from the 73d parallel.

They, moreover, develop facts of great importance in a physico-geographical point of view: first, by exhibiting throughout the range of coasts between the arctic and polar circle no perceptible change in the number and species of plants therein collected; which seems to establish that the third or polar zone of Sir J. Richardson, as far at least as Greenland is concerned, might as well begin at the 67th as at the 73d degree of north latitude. Secondly: By the reappearance, beyond the limits of Smith's sound, of two plants, ***Hesperis Pallasii*** and ***Vesicaria Arctica***, belonging rather to the milder parts of the arctic zone. Both these plants were gathered, with a few

others, on the newly discovered lands of Washington and Humboldt, on the very verge of that mysterious polar sea which Dr. Kane's expedition had the chance to espy and ascertain to be free from ice as far as the eye could reach. Such a fact, indeed, although limited to two species, seems to indicate the existence of peculiar isothermal influences, depending either on warm currents, greater depth of water, or actual depression of our globe at its poles.

Another remarkable feature of Dr. Kane's collections is: That, dividing into two equal parts the extent of coast, explored by him, and each section presenting about the same number of stations at which herborizations were made—the northern section, from Uppernavik, 73°, to Washington land, has yielded more dicotyledonous; but fewer monocotyledonous species than the southern section from Fiske Fiord to 73° north parallel.

These unexpected results show that the polar zone cannot, properly, be compared with the alpine regions of the more temperate climates. The uninterrupted action of light and heat, during the whole period between the rising and setting of the sun, which make the day or summer season of the poles; a purer and damper atmosphere, aided perhaps by a greater accumulation of electric fluid, must, necessarily, and more promptly (in the lowest levels) actuate and perfect the vegetation, not only of the plants already inured to those hyperborean regions; but also of those the seeds of which may have been transported either from milder climates, by currents, migration of birds, or otherwise. Unlike the snow-capped and barren summits of alpine regions, at all times destitute of verdure, it is probable that vegetation is permitted to extend to the very pole itself, wherever it meets with proper soil, favourable solar exposure and protection from the blasts of winds.

Dr. Kane also made some remarks upon the flora of the polar zones, considered in relation to temperature. The farthest northern point visited by him produced plants as abundant in number as those of the botanical region of Lancaster sound.

Prof. Haldeman called the attention of the Society to a recent publication by Professor Lepsius, of Berlin, on the sound of the human voice,—and noticed certain sounds in which he thinks Professor Lepsius has not been accurate in the exponents used to indicate them.

Dr. Kane mentioned that the corrections of the observations

upon temperature made during his late expedition to the polar regions, have been recently completed, and result in giving a considerably lower mean temperature than was stated by him in a previous communication to the Society.

A discussion ensued upon the imperfections of thermometers and their want of reliability when used to indicate extremes of temperature, whatever may be their form of construction, or the fluid with which their tubes are filled.

On motion of Dr. F. Bache, Dr. C. W. Short was excused from the duty of preparing an obituary notice of the late Mr. William Short.

The Society proceeded to ballot for candidates for membership,—and the ballot-boxes being afterwards opened by the presiding officer, the following named gentlemen were declared to be duly elected members of the Society:—

Theo. Lacordaire, of Liège.
Dr. Herman Burmeister, of Hallé.
Samuel L. Hollingsworth, M.D., of Philadelphia.
Christian Olrick, of Denmark.

Stated Meeting, May 2.

Present, nine members.

Dr. Dunglison, Vice-President, in the Chair.

Letters were read:—

From Dr. Samuel L. Hollingsworth, dated Philadelphia, April 21, 1856, acknowledging the receipt of notice of his election as a member of this Society: and—

From J. A. Thomas, Assistant Secretary, dated Department of State, Washington, April 19, 1856, announcing a donation for the library.

The following donations were announced:—

FOR THE LIBRARY.

Executive Documents,	2d Session of	33d Congress,	1854–5, 22 vols.
Senate Documents,	„	„	14 vols.
Senate, Miscellaneous,	„	„	3 vols.

Senate Reports, 2d Session of 33d Congress, 1854–5, 1 vol.
Reports of House Committees „ „ 1 vol.
House, Miscellaneous, „ „ 1 vol.
List of Private Claims, „ „ 2 vols.

From the Department of State, Washington.

Report of the Commissioner of Patents, for the year 1851. Part 2. Agriculture. Washington, 1852. 8vo.

Message from the President of the United States to the two Houses of Congress at the commencement of the First Session of the 34th Congress;—with accompanying Documents. Parts I. II. (2 vols.) Washington, 1855. 8vo.—*From the Hon. J. R. Tyson.*

Monthly Notices of the Royal Astronomical Society. Vol. XVI. No. 5. March 14, 1856. London. 8vo.—*From the Society.*

The African Repository. Vol. XXXII. No. 4. April, 1856. Washington. 8vo.—*From the Am. Colonization Society.*

The Astronomical Journal. Vol. IV. No. 20. April 26, 1856. Cambridge. 4to.—*From the Editor.*

The Medical News and Library. Vol. XIV. No. 161. May, 1856. Philadelphia. 8vo.—*From Blanchard & Lea.*

Mr. Trego laid upon the table a specimen of "Colombian Guano," from Monks' Islands, in the Caribbean Sea, near the entrance to the Gulf of Venezuela or Maracaibo. The specimen was presented by Dr. A. S. Piggot, of Baltimore, from whom the following communication has since been received.

In the spring of 1855, there was brought into the port of Baltimore a hard, rocky substance, which was offered for sale under the name of Colombian Guano. At first, there was a great effort made to involve in mystery the whole history of the article, its locality being carefully kept secret. Gradually, however, it became known that it was found on Los Monges, a collection of keys at the entrance of the Gulf of Maracaibo. It has also been found on El Roncador, off the Mosquito coast, on Aves and various other keys of the Caribbean sea. On Los Monges, it forms, as the captains who procured it say, a thin polished crust over the entire surface. Below this crust lies the common Mexican guano. In some instances, however, this same smooth incrustation covers thinly the jutting points of primitive and metamorphic rocks. I have before me a splinter of rock of this kind, crested with an inch-thick deposit of this guano; and I have seen many in which the white crust formed a thin lamina over the surface. Many such

were brought in, in the first cargo, which will account for the large amount of sand in the subjoined analysis. Only the ground guano was thus sent to me, so that the analysis represents the commercial article, not a selected specimen. The actual guano contains only about 0.5 per cent. of siliceous matter.

The unusual quantity of phosphoric acid, contained in this substance, attracted attention, and many analyses were made of the new guano. The habit of calculating the phosphates in these Mexican guanos, as bone earth, or tribasic phosphate of lime, led some chemists into grievous errors. The new material was, in one breath, called a super phosphate of lime, and in another, said to contain from seven to eleven per cent. of *free phosphoric acid*. In common with other chemists of Baltimore, on the first importation of this guano, I made an analysis of it, and found it to contain a large proportion of phosphates, but expressed no opinion as to their composition. At last, however, hearing so much said about the soluble phosphoric acid in this substance, I examined it more carefully, and found but little of this acid soluble in water, and none of it *free*. I obtained the following results:

Phosphoric acid,	41.62
Sulphuric acid,	3.65
Chlorine,	.05
Lime,	33.83
Magnesia,	3.27
Iron,	a trace.
Fluorine,	a trace.
Sand (consisting chiefly of primitive rocks in powder)	5.34
Water (hygrometric),	2.15
Organic matter, salts of ammonia (containing 0.23 of ammonia) and combined water,	8.62
Loss, in which are the alkalies (not estimated)	1.47
	100.00

The proportions of the phosphates vary in different samples. Thus, in one specimen, recently examined, there was a very small proportion of magnesia and 4.23 per cent. of phosphate of iron.

The organic matter was partly soluble in hydrochloric acid, and partly in potash. A cursory examination of it seemed to indicate

that it consisted chiefly of humus and the acids of the crenic group.

From this analysis I thought myself justified in announcing that the lime and magnesia in the compound under consideration are combined with the phosphoric acid so as to form a tribasic salt, in which one atom of water substitutes one atom of alkaline earth, according to the formula 2 MO, HO, PO_5. A subsequent examination and recalculation of my results has convinced me that the announcement was somewhat premature, and that the analysis would not fully bear the construction put upon it. I have, however, never changed the opinion then advanced, as the discrepancies are slight and easily accounted for.

The statement of my views led to further investigation. Among others, Dr. Campbell Morfit examined the substance, and came to a different conclusion from that at which I had arrived. Drs. Higgins and Bickell, Chief and Assistant State Chemists of Maryland, shortly after published a paper in which they agreed with me in the main. Their analysis was more elaborate than mine, and comprised two distinct examinations; one of the white, polished crust, the other of the body of the rock. Without going into minutia, I will simply state that they found the exterior layer to contain phosphates of lime and magnesia, of the formula 3 MO PO_5 while, in the body of the rock, the salts were composed, as I had previously announced. They also ascertained that in the outer layer the sulphuric acid was combined with soda, while in the body of the rock it was united to lime.

A discussion ensued upon the application and effect of sundry articles used as manures, and their influence upon different soils and crops,—in which Dr. Dunglison, Prof. Frazer, Dr. F. Bache and Mr. Trego participated.

Stated Meeting, May 16.

Present, sixteen members.

Prof. Frazer, Vice-President, in the Chair.

Dr. S. L. Hollingsworth, a recently elected member, was introduced and took his seat.

The following donations were announced:—

FOR THE LIBRARY.

Proceedings of the American Association for the Advancement of Science. *Seventh Meeting*, held at Cleveland, Ohio, July, 1853:—and *Ninth Meeting*, held at Providence, R. I. August, 1855, 2 vols. 8vo.—*From the Association.*

Vierzigster Jahresbericht der Naturforschenden Gesellschaft in Emden, für 1854. 8vo.—*From the Natural History Society, Emden.*

Die Temperatur von Emden, als Ergebniss der daselbst von 1844 bis 1853, auf den Stand des Thermometers gerichteten Beobachtungen: von Dr. M. A. F. Prestel. 1855. 4to.—*From the Author.*

Proceedings of the Boston Society of Natural History. Vol. 5, Nos. 20, 21. Boston. 8vo.—*From the Society.*

Chambersburg, in the Colony and the Revolution. A Sketch. By Lewis H. Garrard, Mem. Hist. Soc. Penna. &c. Philadelphia, 1856. 8vo.—*From the Historical Society of Pennsylvania.*

Journal of the Franklin Institute. Third Series. Vol. XXXI. No. 5. May, 1856. Philadelphia. 8vo.—*From the Institute.*

The African Repository. Vol. XXXII. No. 5. May, 1856. Washington. 8vo.—*From the Am. Colonization Society.*

Constitution and By-laws of the Academy of Sciences of Saint Louis. St. Louis, 1856. 8vo.—*From the Academy.*

Reports of the Prison Discipline Society, Boston, 1826 to 1853. 3 vols. Boston. 8vo.—*From the Society.*

Flora Batava, of Afbeelding en Beschrijving van Nederlandsche Gewassen. Aflevering 178. Amsterdam. 4to.—*From the King of Holland.*

Standard Alphabet for reducing unwritten Languages and foreign Graphic Systems to a uniform Orthography in European letters. By Dr. R. Lepsius, Prof. Univ. and Mem. Roy. Acad. Berlin. 1855. 8vo.—*From the Author.*

The American Journal of Science and Arts. Second Series. Vol. XXI. No. 63. May, 1856. New Haven. 8vo.—*From Profs. Silliman & Dana, Editors.*

The U. S. Naval Astronomical Expedition to the Southern Hemisphere, during the years 1849, '50, '51, '52. Lieut. J. M. Gilliss, Superintendent. Vols. 1, 2. Washington, 1855. 8vo.—*From the Hon. Job R. Tyson.*

Catalogue of the Books belonging to the Library Company of Philadelphia. Vol. III. Containing the Titles added from 1835 to 1856 :—together with an Alphabetical Index to the whole. Philadelphia, 1856. 8vo.—*From the Company.*

Dr. Franklin Bache announced the decease of Dr. John C. Warren, of Boston, a member of this Society, who died on the 4th inst. in the 78th year of his age.

Messrs. Eckfeldt and Dubois exhibited to the meeting an apparatus for ascertaining the specific gravity of ores, metals, coins, gems, &c. with the following descriptive communication.

The apparatus for taking specific gravity of solids is, essentially, a tin cup, with a spout at the side. Five vessels are here shown, of different sizes and shapes, to suit different cases. Four of these are cylindrical, ranging from six to ten inches high, and from two to five inches in diameter. The tall one (ten inches by two), is intended for the trial of silver spoons and forks, or articles of similar shape; the others are adapted to lumps of stone or metal, or blocks of wood, of various sizes. The fifth vessel is rectangular, measuring $6\frac{1}{2}$ inches high, $1\frac{3}{4}$ inches long, and $\frac{1}{4}$ inch broad, being intended for coins, not smaller than the half eagle, or quarter dollar, and for small medals, and gems of admissible size. This vessel is provided with a brass plate, as a *plunger*, for diminishing the surface. The smaller vessels are set firmly in mahogany blocks, to insure steadiness in the operation; and these blocks have screw feet, for convenience of levelling. The spouts extend upward, with a curve outward, the beak being far enough below the top of the cup to allow for the space to be taken up by the specimen, that it may not force the water over the top nor leave any point uncovered by water. The aperture of the spout is tapered to the one-sixteenth of an inch, and a small bit of wire projects downwards from the beak, to carry the drops of water properly. A small cup is placed directly under, to catch the water displaced, and a brass weight, equal to the weight of this cup when empty, is found convenient (though not necessary) as a counter-weight.

When the operation is to be performed, suppose upon a gold or silver ore, the ore is first weighed, and afterwards its surface is moistened. The vessel is then nearly filled with water, and so much as is superfluous, or above the level of the beak of the spout, runs or drips off, to a final drop. The small cup is then set under the beak, and

the lump is carefully lowered into the vessel by a hair wire, or waxed thread. This, of course, displaces its own bulk of water, which runs off into the small cup, gradually coming back to the former level, by a final drop. The weight of this water is the divisor, the weight of the lump the dividend, and the quotient is the specific gravity.

In connection with this apparatus, the following miscellaneous remarks are offered to the Society.

The opening of the gold mines of California brought out a great number of beautiful specimens of gold in the matrix (or mingled with quartz) of the most fanciful forms, and every variety of size and value. In many cases it was presumed, by the holders of these prizes, that they would bring more money, as curiosities, than as bullion; and, at any rate, very many owners were unwilling to have such attractive specimens spoiled until they had been sufficiently exhibited. At the same time, it was always desirable to know, pretty nearly, how much gold was actually contained; and, to obtain such estimates, upon what was supposed to be reliable authority, many of these specimens were brought to the assay office of the mint. They came at a time when we were overpowered with the legitimate business of the office, and yet it seemed impossible to refuse such requests; and, for a considerable time, such employment was interesting as a matter of scientific inquiry. Especially when we could compare our estimates with the more definite and accurate results obtained by putting the specimens or "nuggets" through the regular routine of melting and assay. On one occasion a lump, weighing over 200 pounds, came to us for this purpose. It was sent by the Isthmus route, at a time when transportation was enormously dear, and having visible gold on the surface, was expected to be rich throughout the mass; and, with this expectation, was on the way to London, to make an impression upon the stock market there. By the aids of a very large steelyard beam and copper kettle, we were enabled to take the specific gravity, but could not make it higher than that of compact quartz. The result seemed so questionable, that we obtained permission to break up the rock, and found that what little gold it contained was at the surface.

Not only were ores brought to us from California, to be estimated, but also from other mining regions, and of various metals; but chiefly gold and silver. As the specimens were of all sizes, these demands upon us often proved embarrassing, since it was necessary to have beams suited to them, and with attachments for weighing in water. We therefore had frequent recourse to the method advised by the elder Dr. Patterson (formerly President of this Society), which con-

sisted in using a jar or pitcher, rather larger than the specimen, and not over-large at the mouth; this was filled with water up to a marked line; and then, by introducing the specimen, and bringing back the water to the same line, so much water was removed as was just equal in bulk to the bulk of the specimen; the weight of this water gave the divisor, the weight of the specimen (taken while dry), the dividend, and the quotient was the specific gravity.

The results thus obtained were, generally, as satisfactory as those by the usual method. And here it may be interesting to cite a few examples, from our minutes, of specimens estimated by one or other of the processes mentioned, and afterwards melted down and assayed as regular deposits.

1. A lump of quartz, containing gold, found by two Mexicans of the "Sonorian camp," in California, weighed $265\frac{1}{2}$ ounces; assuming the quartz at the sp. gr. of 2.60, the amount of gold appeared by sp. gr. of the lump, to be $209\frac{1}{2}$ ounces; the actual amount was $211\frac{1}{8}$ ounces.—2. Another lump, where we assumed the matrix at 2.64, gave an estimate of $100\frac{1}{8}$ ounces of gold; the actual product was $100\frac{1}{10}$ ounces.—3. Four pebbles taken together, estimated at 77 ounces; actual content, $76\frac{8}{10}$ ounces.—And, lastly, a lump which had been bought in California for 800 dollars, and which weighed $408\frac{1}{2}$ ounces, gave an estimate of $89\frac{1}{2}$ ounces, or 1572 dollars, taking the matrix at 2.63; the actual yield was $91\frac{2}{10}$ ounces, or 1602 dollars; the fineness being 850 thousandths. In this case there was an error of 30 dollars, or about two per cent. upon the value; an amount of error to which such specimens are liable, with any apparatus.

But it was obvious that the method of displacement required a series of vessels, specially adapted to the operation, to compete with weighing, in closeness of results. After a good deal of reflection, and experimenting, in which many modifications of shape and arrangement were tried and discarded, and which it would be cumbersome to notice in this place, the apparatus now shown was found to answer best. In practice, it is really a pleasant and satisfactory substitute for the tedious and irksome method usually resorted to. Some few precautions must, of course, be attended to. The vessel must stand firmly. If at first the water will not flow, or flows fitfully, the obstruction will be removed by blowing a little in the spout.

An investigation of some interest, growing out of this matter, may properly be noticed. Where we are operating upon substances of low specific gravity, say wood or stone, a drop or two of water, or

the size of the drop, in tapering off the divisor, is of no consequence. But it is otherwise in the case of a gold coin, for example:—in a double eagle, the difference of one drop of water (ordinarily about a half-grain) in the divisor, would affect the result to the extent of 0.3, which, carried into the fineness, would make a difference of 15 or 20 thousandths; and in the case of a half-eagle, the uncertainty of result would be proportionally increased. The question then arose, what fluid, or what modification of water, will afford us a smaller drop? for, as was just observed, a half-grain is, on the average, the smallest weight of clean water that will detach itself by its own weight. Very much depends, of course, upon the size of the aperture, in the measure of drops of fluid; one drop of water, from a large beak, weighed $1\frac{1}{3}$ grains. In the Dispensatory of Drs. Wood and Bache, there is a table of the experimental results of Mr. Durand, showing the number of drops of different liquids equivalent to a fluidrachm (Page 1405). The differences are very remarkable; distilled water, for instance, being set down at 45 drops, and pure alcohol at 138 drops. And in our own experiments, the drop of alcohol was about one-third the weight of the drop of water, from the same pipette. This seemed to point to alcohol as a substitute; but there were obvious objections, and a much better vehicle was found in *soapy water*.

The best white soap, sold at the shops, is of the same specific gravity as water, and its mixture with water makes no change, in that respect. When the mixture is as strong as children use for blowing bubbles (we cannot conveniently give this measure in figures), the cohesion or tenacity of the water is so much weakened that the drop is reduced to one-tenth of a grain. No other fluid makes so small a drop as this. And there is the further advantage, that soapy water, though excellent for making bubbles, is less liable to retain them below the surface than pure water. So small a drop, of course, makes the experiment more tedious, and, by using less soap, the size of the drop will be, in many cases, advantageously increased.

Some years ago, at the desire of Prof. Henry, experiments were made in the assay-office, to test the comparative tenacity of pure water and soapy water, by observing how much weight, at a beam, would detach metallic disks held together by those fluids, respectively. This problem is more readily solved by the method just stated; namely, by observing the size of the drop.

This apparatus has a decided advantage for taking specific gravi-

ties of substances lighter than water; it being only necessary to hold them down by a pin or wire. By the usual method, the operation is complicated. The following are a few duplicate results, given to show the uniformity which is attainable by this mode.

Fine silver,	10.55	repeated,	10.55
Gold double eagle,	17.14	do.	17.37
Lead,	11.315	do.	11.307
Pyritous iron ore,	3.912	do.	3.919
Agate,	2.607	do.	2.604
Lithographic stone,	2.669	do.	2.670
Coarse quartz,	2.589	do.	2.599
Birch wood,	0.931	do.	0.934
White pine wood,	0.371	do.	0.379

These figures correspond sufficiently with the results given in books; which, however, very commonly disagree, even at the first decimal; chiefly because of the want of homogeneity, or uniform compactness in substances operated upon.

It will be objected to this process, that it is going back to the first crude idea of Archimedes, and rejecting subsequent improvements. It may claim, however, to be a refinement upon that philosopher's bath-tub; and if the operation is easy, and the results are good, not much further need be said. For specimens of very small size, and high density, the balance would be preferable; but the genuineness of a gold coin, as small as the half-eagle, is easily determined by the cup. And to demonstrate, to a class of learners, the *principle* of specific gravity, this is evidently to be preferred to the weighing in water, which is an after-thought of some complexity.

Stated Meeting, June 20.

Present, eleven members.

Prof. FRAZER, Vice-President, in the Chair.

Letters were read:—

From the Etat Major of the Corps of Mining Engineers of Russia, dated St. Petersburg, Feb. 25, 1855;—from the Imperial Society of Naturalists of Moscow, dated 1–13 August, 1855;—from the Imperial Academy of Sciences at Vienna,

dated Nov. 1, and Dec. 30, 1855;—from the Imperial Geological Institute, dated Vienna, Sept. 23, 1855; severally announcing donations for the library:—

From the Director of the Physical Central Observatory of Russia, dated St. Petersburg, 18–30 March, 1855; acknowledging the receipt of Vol. X. Part 3 of the Transactions of this Society;—from the Royal Academy of Sciences at Amsterdam, dated Jan. 15, 1856;—from the Horticultural Society of Berlin, dated Feb. 8, 1856;—and from the Royal Society of London, dated Somerset House, March 8, 1856,—returning thanks for Nos. 51, 52, of the Proceedings:—

From the Royal Bavarian Academy of Sciences, dated Munich, Jan. 12, 1856, accompanying a donation for the library, and acknowledging the receipt of Nos. 45, 46, 51 and 52 of the Proceedings; and from the same, dated Jan. 20, 1856, requesting to be furnished with duplicate copies of all the publications of this Society:—

From the Royal Society of Sciences at Göttingen, dated March 23, 1856, transmitting one impression in silver and one in bronze, of a medal struck by order of His Majesty the King of Hanover, in memory of Dr. Charles Frederic Gauss, the eminent mathematician and astronomer: and—

From the Academy of Science of St. Louis, Missouri, dated May 30, 1856, requesting a correspondence with this Society, and offering to give extinct mammalian fossils in exchange for the Transactions of the Society, or for other books or articles.

The following donations were announced:—

FOR THE LIBRARY.

Abhandlungen der K. K. Geologischen Reichsanstalt. Band II. Wien, 1855. Fol.

Jahrbuch der K. K. Geologischen Reichsanstalt. VI. Jahrgang. No. 1. Jan. Feb. Mar. No 2. Apr. May, Jun. 1855. Wien, 8vo.—*From the Imp. Geological Institute, Vienna.*

Coup d'œil géologique sur les Mines de la Monarchie Autrichienne. Redigé, par ordre de l'Institut Impérial et Royal de Géologie, par le Chevalier Fr. de Hauer et Fr. Fœtterle;—avec une introduction par Guillaume Haidinger. Vienne, 1855. 8vo.—*From the Authors.*

Sitzungsberichte der Kaiserlichen Akad. der Wissenschaften:—Math. Nat. Classe, XVI. Band, 2 Heft; XVII. Band, 1, 2, 3 Heft:—Phil. Hist. Classe, XVI. Band, 2 Heft; XVII. Band, 1, 2 Heft. Wien, 1855. 8vo.—*From the Imp. Acad. Sciences, Vienna.*

Annales de l'Observatoire Physique Central de Russie, &c. Par A. T. Kupffer, Directeur de l'Observatoire. Année 1852. St. Petersburg, 1855. 4to.—*From the Administration of Mines of Russia.*

Bulletin de la Société Impériale des Naturalistes de Moscou, publié sous la redaction du Docteur Renard. Tome XXVII. Année 1854. Nos. 2, 3, 4. Tome XXVIII. Année 1855. No. 1. Moscow. 8vo.—*From the Society.*

Philosophical Transactions of the Royal Society of London, for the year 1855. Vol. 145. Part 2. London. 4to.

Proceedings of the Royal Society of London. Vol. VII. Nos. 3, 4,—16, 17. Vol. VIII. No. 18. London. 8vo.—*From the Society.*

Quarterly Journal of the Chemical Society. Vol. IX. No. 33. April 1856. London. 8vo.—*From the Society.*

Monthly Notices of the Royal Astronomical Society. Vol. XVI. No. 6. April 11, 1856. London. 8vo.—*From the Society.*

Journal of the Royal Dublin Society. Vol. I. No. 1. April, 1856. Dublin. 8vo.—*From the Society.*

Proceedings of the American Association for the Advancement of Science. First Meeting, held at Philadelphia, 1848;—Second, at Cambridge, 1849;—Third, at Charleston, 1850;—Fifth, at Cincinnati, 1851, (not previously received).—*From the Association.*

Proceedings of the Academy of Natural Sciences of Philadelphia. Vol. VIII. No. 2. Philadelphia, 1856. 8vo.—*From the Academy.*

Proceedings of the Elliott Society of Natural History of Charleston, S. C. Nov. 1, 1853 to July 24, 1855. Charleston. 8vo.—*From the Society.*

Journal of the Franklin Institute. Vol. XXXI. No. 6. June, 1856. Philadelphia. 8vo.—*From the Institute.*

Fourth Annual Report of the Trustees of the Free Public Library of New Bedford. Presented to the City Council, March 31, 1856. New Bedford. 8vo.—*From the Trustees.*

Thirty-fifth Annual Report of the Mercantile Library Association of the City of New York, May, 1856:—With the Report of the

Trustees of the Clinton Hall Association. New York. 8vo.—*From the Trustees.*

The African Repository. Vol. XXXII. No. 6. June, 1856. Washington. 8vo.—*From the Am. Colonization Society.*

Message from the President of the United States to the two Houses of Congress, at the commencement of the First Session of the Thirty-fourth Congress:—With accompanying Documents. *Part* 3. Washington, 1855. 8vo.—*From the Hon. J. R. Tyson.*

Professor William Chauvenet's Great Circle Protractor,—with Description and Application. Annapolis. 1854.—*From the Author.*

Eulogy on the Life and Character of Theodric Romeyn Beck, M.D. L.L.D. Delivered before the Medical Society of the State of New York, by Frank Hastings Hamilton, M.D. Albany, 1856. 8vo.—*From Mr. John H. Hickox.*

A Discourse on the Necessity of Revelation to the Knowledge of the Existence of God, Spirit and Immortality. By C. F. H. Crockett, M.D. Richmond, 1856. 8vo.—*Donor unknown.*

The Astronomical Journal. Nos. 93, 94. (Vol. IV. Nos. 21, 22). Cambridge. 4to.—*From Dr. B. A. Gould, jr. Editor.*

On the New Red Sandstone Formation of Pennsylvania.—Description of a new Sub-Genus of Naiades.—Description of a New Species of Triquetra.—Description of New Fresh Water Shells from California.—Description of Twenty-five New Species of Exotic Uniones. By Isaac Lea, L.L.D. &c. &c. (Proc. Acad. Nat. Sci.) Philadelphia, 1856. 8vo.—*From the Author.*

The Medical News and Library. Vol. XIV. No. 162. June, 1856. Philadelphia. 8vo.—*From Blanchard & Lea.*

FOR THE CABINET.

Two Medals, one of silver and one of bronze, in memory of Dr. Charles Frederick Gauss, struck by order of H. M. the King of Hanover, and presented through the *Royal Society of Sciences at Göttingen.*

Dr. Hallowell presented a paper entitled "Notice of some New and Rare Species of Scincidæ, in the Collection of the Academy of Natural Sciences of Philadelphia," which was referred to a Committee, consisting of Dr. Le Conte, Dr. Bridges and Mr. Lea.

A communication by Dr. Leidy was offered, entitled "Notice of Remains of the Walrus discovered in the United States," which was referred to Dr. Hallowell, Prof. Frazer and Major Le Conte.

A paper was presented and read from Messrs. Eckfeldt and Dubois, explanatory of their communication read at the last meeting, on an apparatus for determining specific gravities.

Messrs. Eckfeldt and Dubois desire to offer a word of explanation, in regard to the apparatus for taking specific gravities, which was exhibited at the last meeting of the Society. A few days after that meeting, Dr. Bache had the kindness to call upon us with a copy of the May number of the London Pharmaceutical Journal, which he had then just received. In it was detailed a contrivance, for the same purpose, and on the same principles, which had been exhibited at the North British Branch of the Pharmaceutical Society, held at Edinburgh on the 11th April. And it was further mentioned, that the same apparatus had been shown at a meeting of the Royal Scottish Society of Arts; and a committee, the chairman of which was Dr. George Wilson, Professor of Technology, was appointed to report upon its merits; which report was made on the 23d July, 1855, and the Society's medal was awarded to Mr. P. Stevenson, the inventor.

We have first to say, that, being entirely ignorant of these proceedings, and of this apparatus, we, of course, derived no aid or suggestion from this source. It has so happened, as it has happened before, that the same idea was acted upon by two minds, independently, and distant from each other, at nearly the same time. The experiments of Mr. Eckfeldt began in December last.

In regard to the principle, of operating by displacement, there will be no dispute as to originality. It was the neat, convenient and accurate *application* of this principle that remained a desideratum.

The apparatus of Mr. Stevenson consists of a tall cylindrical vessel, from which the displaced water runs off by a short spout near the top, having a stopcock or faucet at the end. From this the water runs into a graduated glass vessel of $3\frac{1}{2}$ inches diameter. The object of this graduation is to dispense with a balance, and save the trouble of weighing.

But any one who will take a vessel of only half that diameter, will find that as much as fifteen grains of water may be added, or withdrawn, and the eye will scarcely be able to see any difference. In the apparatus of Mr. Eckfeldt, it was found desirable, for high gravities,

to taper down the displaced water to a fifth or tenth of one grain. It is true, that Mr. Stevenson's apparatus is mainly designed for substances lighter than water; but it is also intended for those that are heavier; and, in either case, so large a scope for the divisor would produce very irregular and unreliable results, as it appears to us.

The graduated tube was thought of, and experimented upon; and, after all, it was found that a balance would be indispensable, to obtain satisfactory results. A very fine instrument is not generally requisite, and the weighing can be done nearly as soon as an observation can be made of the marked degrees.

As to the stopcock at the end of the spout, Mr. Stevenson must soon find that this is a superfluity; and, more than that, a source of error and vexation. We found this the case in a supposed improvement, of French invention, in drawing off the dose for humid assays of silver. A drop of water, or a bubble of air, will lie concealed, and spoil the result, or render it uncertain.

As the specific gravities of solids lighter than water, have hitherto been obtained by a complex operation, and as the apparatus of Mr. Eckfeldt is specially adapted to obtain such gravities by a direct and simple mode, we propose, at a future day, to offer to the Society a table of results, as found by this method; particularly of the different kinds of wood, charcoal, &c.

The Secretary was directed to inform the Royal Bavarian Society of Sciences at Munich, that this Society is unable to comply with their request to be supplied with duplicate copies of the publications of the Am. Philosophical Society.

The Academy of Sciences at St. Louis, Missouri, and the Elliott Society of Natural History, of Charleston, S. C. were ordered to be placed on the list of Corresponding Societies.

A letter signed J. R. Lambdin, dated Philadelphia, June 12, 1856, and addressed to the American Philosophical Society, was read, in which Mr. Lambdin informs the Society that it is his intention shortly to visit Europe, and that he desires, while there, to execute original portraits of some of the most eminent scientific men of the countries which he may visit:—

Whereupon, a preamble and resolution upon the subject were offered by Mr. Henry D. Gilpin, which were read and postponed for consideration at the next meeting of the Society.